Trend Study 14-1-99

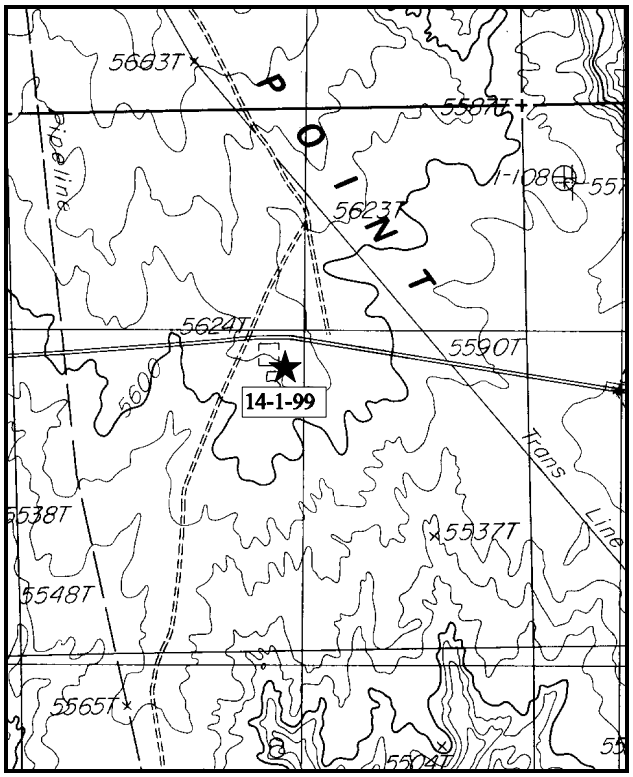
Study site name: Alkali Point . Range type: Big Sagebrush .

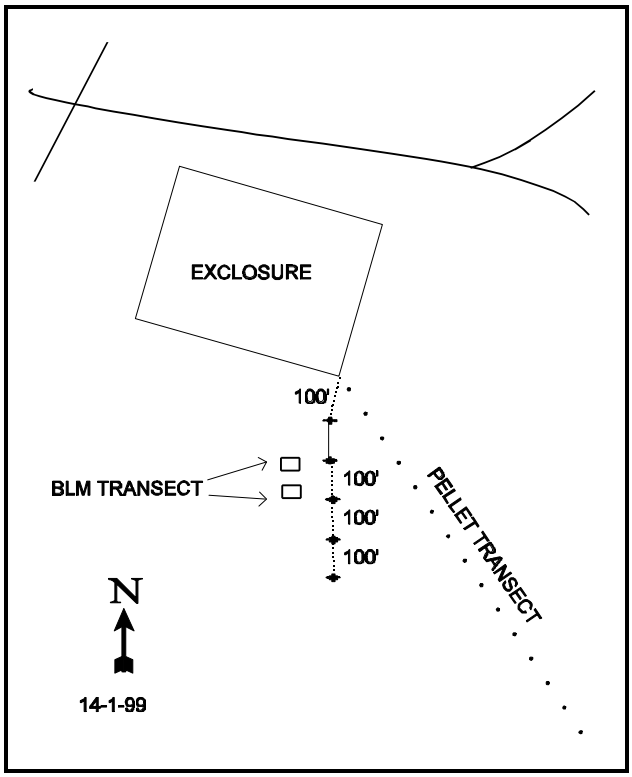
Compass bearing: frequency baseline 180°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Turn east by A & M Propane 0.2 miles south of the UDOT shed on the south end of Blanding on SR-l91. Go 1.15 miles. Turn right (south) on county road #206 and travel along the main gravel road 7.0 miles to a fork. Stay right (passing the turnoff to "mustang", county road #207) and proceed 1.8 miles to another fork. Stay left and go 5 miles. Stop at the northeast corner of the exclosure. The transect starts 100 feet off the southeast corner (in line with the east boundary fence) and runs south from there. The 0-foot baseline stake is a fence post marked with a browse tag.





Map Name: Bradford Canyon Diagrammatic Sketch

Township 38S , Range 24E , Section 5 UTM 4152865.177 N, 649931.177 E

DISCUSSION

Trend Study No. 14-1 (35-1)

The Alkali Point study is within an area that is considered an important wintering area for deer moving southwest off the Abajo Mountains. The long, flat tablelands are cut by intermittent-flow canyons which supports a pinyon-juniper woodland with extensive openings created by chaining treatments in the early 1960's. The study site is in a chained opening dominated by Wyoming big sagebrush with a sparse herbaceous understory which has become increasingly dominated by cheatgrass. There is no evidence of seeded species. There is a BLM exclosure and transect 100 feet to the north of the trend study site. The site drains to the south and has a slope of about 5% at an elevation of 5,600 feet and western aspect. Water is limited on the flat. Past use on the area has included spring cattle grazing. Deer pellet groups are abundant, with an average of 45 deer days use/acre (111 deer days use/ha) from 1986 to 1995. Pellet group data from 1999 estimate 135 deer days use/acre (333 deer days use/ha). Human activity includes gas and oil exploration and drilling, pipeline and road construction, livestock grazing, and recreational activities.

The soil is moderately deep with an estimated effective rooting depth of nearly 16 inches. Soil texture is a sandy clay loam with a slightly alkaline pH (7.4). Phosphorus and potassium levels are low at 5.8 ppm and 54.4 ppm respectively. Levels of phosphorus less than 10 ppm and potassium levels less than 70 ppm have been determined to be limiting to plant growth and development. Protective ground cover is composed primarily of sagebrush with an understory of annual cheatgrass. Percent bare ground has increased from 42% in 1986 to 53% in 1994, then down to 30% by 1999 with increases in cheatgrass cover. Litter is centered mostly under the shrubs. Rock and pavement are scarce and combine to produce less than 1% of the ground cover.

The dominant browse species is Wyoming big sagebrush which made up 87% of the total browse cover in 1999. The sagebrush stand has become overly mature with poor reproduction and high decadence found during all readings. Density of sagebrush was estimated at 4,399 plants/acre (mostly decadent) in 1986, declining to 2,680 in 1994. Much of the difference in density is due to the much larger sample used in 1994, but it is apparent that the population is declining. Dead plants, first counted in 1994, totaled 860 plants/acre. Data from 1999 estimate 2,160 plants/acre with 1,300 dead plants. Percent decadency is currently extremely high at 80%, an increase from 65% in 1986. Utilization was extremely heavy in 1986 with 88% of the plants sampled displaying heavy use. The level of use declined in 1994 with only 13% of the sagebrush being heavily browsed. In 1999, utilization was heavy on 46% of the plants sampled. Leader growth and seed production are poor. Sagebrush in the nearby livestock exclosure also showed moderate to heavy utilization in 1999. Leader growth and seed production was also poor in the exclosure. Further evidence that much of the problem is with the extended drought and competition with the dense understory of cheatgrass. Sagebrush cover appeared lower in the exclosure with a more complete cover of cheatgrass and the annual forb storksbill in the understory.

More numerous and also more vigorous than the sagebrush is broom snakeweed. It currently provides 13% of the total browse cover. There were 7,240 plants per acre estimated in 1994 with a high biotic potential of 33%. Density declined in 1999, but young plants are numerous and make up 14% of the population. There are a few Juniper on the flat, but they do not appear to be aggressively increasing and provide very little escape or thermal cover.

The herbaceous understory is poor and dominated by annual grasses, cheatgrass and sixweeks fescue. Annuals were not included in the sample in 1986, however in 1994 cheatgrass provided 63% of the grass cover. The only common perennial grass encountered that year was bottlebrush squirreltail. By 1999, cheatgrass increased significantly and currently provides 92% of the grass cover and 90% of the total herbaceous cover. Sixweeks fescue remained at a similar frequency compared to 1994, while bottlebrush squirreltail declined significantly in nested frequency. Forbs are scarce and currently (‘99) provide less than 1% cover and cutleaf filaree provides 92% of the forb cover.

1986 APPARENT TREND ASSESSMENT

There appears to be a downward trend in terms of Wyoming big sagebrush. Use appears heavy with growth and reproduction appearing generally poor. Also, much of the new growth is unavailable due to the hedged and stiff character of the older shrubs. Diversity is very limited, especially for the herbaceous component. Soil trend is down because of poor ground cover and continued soil loss.

1994 TREND ASSESSMENT

Wyoming big sagebrush has not been as heavily used as previously reported. However, the percentage of the plants with poor vigor has nearly doubled from 21% to 49% while percent decadency has remained similar. In addition, 54% of the decadent plants sampled appeared to be dying. Density has declined, although some of the change may be due mostly to the greatly increased sample size used in 1994. Dead plants, first sampled in 1994 number 860 plants/acre which would indicate a population decline. Reproduction is poor with some seedlings sampled but no young. Broom snakeweed has increased from 5,999 plants/acre in 1986 to 7,240 plants/acre in 1994. There were many seedlings encountered in 1994 (2,380 plants/acre), which would indicate a expanding population. As in 1986, herbaceous understory is not very diverse with three grasses and two forbs comprising 86% of the understory cover. Cheatgrass is the most abundant grass followed by six-week fescue, both are annuals. Soil trend is down with an 11% increase in bare ground from 42% in 1986 to 53% in 1994. Litter cover decreased from 46% in 1986 to 24% in 1994.

TREND ASSESSMENT
soil - down
browse - down
herbaceous understory - stable but in poor condition

1999 TREND ASSESSMENT

The soil trend is up due to a decline in percent bare ground from 52% to 30% and an increase in litter cover from 24% to 42%. However, these improvements are due primarily to the dramatic increase in cheatgrass. Erosion is not currently a problem. The browse trend is down due to a decline in population density, an increase in heavy utilization, and an increase in percent decadency from 63% to 80%. There is no reproduction and leader growth and seed production are poor. On the positive side, broom snakeweed has declined in density from 7,240 to 4,660 plants/acre. Trend for the herbaceous understory is also down due to a decline in perennial grasses and forbs and a dramatic increase in cheatgrass. Quadrat frequency of cheatgrass remained similar (99 to 100) but nested frequency increased significantly and cover increased 6 fold from 4% to 23%.

TREND ASSESSMENT
soil - up
browse - down
herbaceous understory - down and dominated by cheatgrass

HERBACEOUS TRENDS --
Herd unit 14 , Study no: 1

Type	Species	Nested Frequency '86	'94	'99	Quadrat Frequency '86	'94	'99	Average Cover % '94	'99
G	Bromus tectorum (a)	-	$_{a}$287	$_{b}$388	-	99	100	3.65	22.55
G	Hilaria jamesii	5	11	6	3	5	3	.12	.16
G	Oryzopsis hymenoides	$_{a}$-	$_{b}$9	$_{b}$6	-	3	3	.19	.04
G	Sitanion hystrix	$_{b}$111	$_{b}$105	$_{a}$16	60	53	9	1.42	.20
G	Vulpia octoflora (a)	-	171	159	-	67	57	.36	1.65
Total for Annual Grasses		0	458	547	0	166	157	4.01	24.21
Total for Perennial Grasses		116	125	28	63	61	15	1.74	0.40
Total for Grasses		116	583	575	63	227	172	5.75	24.62
F	Astragalus convallarius	13	9	6	6	4	3	.02	.01
F	Astragalus mollissimus	$_{b}$4	$_{a}$-	$_{a}$-	3	-	-	-	-
F	Astragalus spp.	$_{a}$-	$_{b}$48	$_{a}$-	-	23	-	.12	-
F	Cryptantha spp.	$_{a}$-	$_{b}$13	$_{a}$-	-	7	-	.06	-
F	Cymopterus acaulis	-	2	-	-	1	-	.00	-
F	Erodium cicutarium (a)	-	$_{a}$7	$_{b}$49	-	2	18	.01	.33
F	Euphorbia fendleri	$_{b}$13	$_{a}$-	$_{a}$-	4	-	-	-	-
F	Gilia spp. (a)	-	4	-	-	2	-	.01	-
F	Lappula occidentalis (a)	-	$_{b}$26	$_{a}$-	-	10	-	.05	-
F	Navarretia intertexta (a)	-	$_{b}$-	$_{a}$7	-	-	3	-	.01
F	Orthocarpus spp. (a)	$_{b}$6	$_{c}$60	$_{a}$-	3	30	-	.25	-
F	Phlox longifolia	-	2	-	-	2	-	.01	-
F	Plantago patagonica (a)	-	7	2	-	3	1	.04	.00
F	Sphaeralcea coccinea	$_{b}$5	$_{b}$17	$_{a}$-	3	7	-	.80	-
Total for Annual Forbs		6	104	58	3	47	22	0.35	0.35
Total for Perennial Forbs		35	91	6	16	44	3	1.01	0.01
Total for Forbs		41	195	64	19	91	25	1.37	0.37

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 14 , Study no: 1

Type	Species	Strip Frequency '94	'99	Average Cover % '94	'99
B	Artemisia tridentata wyomingensis	65	67	11.27	8.68
B	Chrysothamnus nauseosus	4	0	-	-
B	Echinocereus spp.	0	1	-	.00
B	Gutierrezia sarothrae	74	61	2.88	1.33
B	Juniperus osteosperma	-	-	.63	.00
B	Opuntia spp.	5	0	.03	-
Total for Browse		148	129	14.82	10.02

CANOPY COVER --
Herd unit 14 , Study no: 1

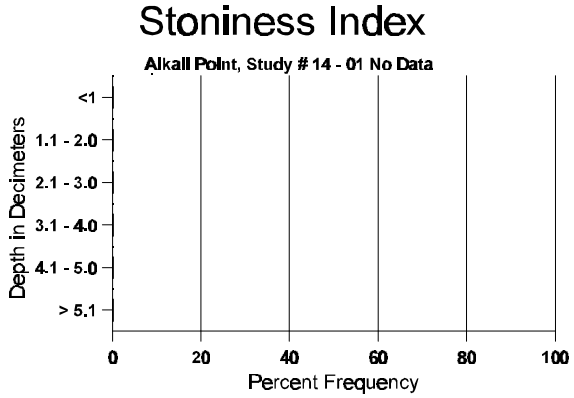
Species	Percent Cover '99
Juniperus osteosperma	.60

BASIC COVER --
Herd unit 14 , Study no: 1

Cover Type	Nested Frequency '94	'99	Average Cover % '86	'94	'99
Vegetation	327	383	3.00	22.54	32.62
Rock	14	12	1.00	.03	.68
Pavement	13	11	.25	.20	.02
Litter	389	352	45.75	24.08	41.93
Cryptogams	128	56	8.00	1.78	1.97
Bare Ground	375	284	42.00	52.84	30.11

SOIL ANALYSIS DATA --
Herd Unit 14, Study # 01, Study Name: Alkali Point

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.8	73.0 (15.6)	7.4	62.9	14.6	22.6	1.7	5.8	54.4	0.4



PELLET GROUP DATA --
Herd unit 14 , Study no: 1

Type	Quadrat Frequency '94	Quadrat Frequency '99	Pellet Transect Days Use/Acre (ha) '99
Rabbit	67	36	N/A
Elk	6	-	-
Deer	43	37	135 (333)
Cattle	-	5	2 (5)

BROWSE CHARACTERISTICS --
Herd unit 14 , Study no: 1

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	-	5	18	-	-	-	-	-	-	18	4	1	-	1533	22	23	23
	94	20	16	12	1	-	-	-	-	-	33	-	11	5	980	23	35	49
	99	-	5	10	-	1	6	-	-	-	22	-	-	-	440	26	33	22
D	86	-	3	40	-	-	-	-	-	-	29	1	-	13	2866			43
	94	58	18	6	2	1	-	-	-	-	35	-	4	46	1700			85
	99	-	38	19	-	12	15	2	-	-	67	-	-	19	1720			86
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	860			43
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	1300			65

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	12%	88%	21%	-39%
'94	26%	13%	49%	-19%
'99	52%	46%	18%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	4399	Dec:	65%
	'94	2680		63%
	'99	2160		80%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	4	-	-	-	-	-	-	-	-	4	-	-	-	80	-	-	4
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'86	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change		
Total Plants/Acre (excluding Dead & Seedlings)	'86	0
	'94	100
	'99	0

Dec:	
	0%
	20%
	0%

Echinocereus spp.																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	13	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'86	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change		
Total Plants/Acre (excluding Dead & Seedlings)	'86	0
	'94	0
	'99	20

Dec:	
	-
	-
	-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	86	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	94	119	-	-	-	-	-	-	-	-	119	-	-	-	2380			119
	99	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
Y	86	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	94	80	-	-	-	-	-	-	-	-	80	-	-	-	1600			80
	99	31	-	-	1	-	-	-	-	-	32	-	-	-	640			32
M	86	83	1	2	-	-	-	-	-	-	86	-	-	-	5733	8	9	86
	94	251	-	-	-	-	-	-	-	-	251	-	-	-	5020	8	9	251
	99	182	14	-	-	-	-	-	-	-	196	-	-	-	3920	9	9	196
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	20	-	-	11	-	-	-	-	-	4	-	-	5	620			31
	99	3	2	-	-	-	-	-	-	-	3	-	1	1	100			5
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	01%	02%	00%	+17%
'94	00%	00%	01%	-36%
'99	07%	00%	.85%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	5999	Dec:		0%
'94	7240			9%
'99	4660			2%

Opuntia spp.																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	3	-	-	1	-	-	-	-	-	4	-	-	-	80	2	4	4
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	0	Dec:		0%
'94	120			17%
'99	0			0%